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RETIREMENT SYSTEM

ACTUARIAL VALUATION

AS OF

JULY 1, 1988

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SECTION I

INTRODUCTION

An actuarial valuation of the Sheriffs' Retirement System of the State of Montana has been completed as of July 1, 1988. This valuation was authorized by the Public Employees' Retirement Board under Section 19-7-201, MCA The purpose of the valuation was to determine the financial position of the fund, the normal cost, and the unfunded accrued liability based upon present and prospective assets and liabilities of the system as of July 1, 1988.

Section II presents an analysis of the results of the actuarial valuation. The numerical findings and membership data supporting this analysis are shown in Section III.

In conducting the actuarial valuation, certain assumptions were made as to the future experience of the system. A summary and discussion of each of the assumptions is contained in Section IV.

The valuation is based upon the Sheriffs' Retirement Act and incorporates all amendments as of July 1, 1988. A summary of the major provisions of the Act is contained in Section V.

ACTUARIAL CERTIFICATION

The results of the actuarial valuation shown in this report are based upon information provided by the Public Employees' Retirement Division regarding plan participants, plan assets and other matters. The values have been calculated on the basis of actuarial assumptions which, in my opinion, are appropriate for purposes of this valuation.

This valuation has been prepared in accordance with generally accepted actuarial principles and practices and, to the best of my knowledge, fairly reflects the actuarial position of the Sheriffs' Retirement System as of July 1, 1988.

Alton P. Hendrickson
Member, American Academy
of Actuaries

SECTION II

ANALYSIS OF VALUATION

Results of Valuation

An actuarial valuation as of July 1, 1988 has been conducted for the Sheriffs' Retirement System. This valuation has determined that the percentage of each member's salary required to fund the benefits as they accrue in the future is 11.126%. The system has no unfunded past service liability.

The variations between this valuation and that of July 1, 1986 are the results of the experience of the Sheriffs' Retirement System versus the expected, as well as a change in the actuarial assumptions.

Actuarial Modifications

A report was prepared on noneconomic actuarial assumptions as of June 30, 1987. This report recommended changes in the mortality, disability, withdrawal and retirement rates assumptions. These assumptions were approved by the board as discussed below.

a. Mortality Rates. Since 1978, the basis for mortality assumptions had been the 1971 Group Annuity Mortality Table. These rates were set back one year to reflect increased longevity. The new mortality basis is the 1983 Group Annuity Mortality Table which reflects recent experience on a national basis. This table is more conservative than the previous basis and anticipates increased longevity.

   This change increased the system's liability by $.8 million.

b. Disability. Previous disability rate assumptions were based upon rates published by the Railroad Retirement Board in its seventh valuation of its retirement system. These rates anticipated disabilities higher than actually experienced by the Public Employees' Retirement System. The new basis is the 1983 Disability Table which anticipates fewer disabilities.

   This change decreased the system's liability by $.1 million.

c. The future salary increase assumption continues at 6 1/2% per annum. No provision was made for a select rate at a lower level for the next few years. Also, the meritorious and longevity increase assumption of 3/4 of 1% has been eliminated. The net impact of this change was a decrease in the system's liability of $.9 million.

The overall effect of the actuarial assumption modifications was a decrease in the system's liability of $.2 million.

The normal cost funding growth from 11.126% to 12.754% was attributable to the change in the active membership. The membership decrease of 32 was comprised mainly of younger members. This tended to increase the average cost per member and increased the liabilities by approximately $1.9 million.

Summary of Data

The active membership declined from 541 members to 509 members, with an annual payroll of $11.2 million. There are 47 retired members, 17 disabled members and 10 individuals receiving survivor benefits. The total annual benefit payout as of July 1, 1988 was $442,296. Assets grew from $19.5 million to $26.1 million.

Conclusion

The system has no unfunded past service liability, and the contribution rate is sufficient to fund benefits as they accrue in the future. A change in membership has caused the normal cost rate to increase slightly but the system remains amply funded.

SECTION III

Sheriffs' Retirement System

SCHEDULE 1

NORMAL COST ALLOCATION

(1)	Normal Cost Contribution Rate:	
	(a) Retirement	8.262%
	(b) Death	0.692
	(c) Disability	2.034
	(d) Vested	0.778
	(e) Withdrawals	0.988
	(f) Total Rate	12.754%
(2)	Present Value of Future Salaries Of Current Members	$ 119,849,302
(4)	Present Value of Future Normal Costs For Current Members (1(f) * (2))	$ 15,285,580

Sheriffs' Retirement System

SCHEDULE 2

PRESENT VALUE OF BENEFITS

(1)	Present Value of Benefits - Inactive Members	
	(a) Retirement	$ 2,585,105
	(b) Death	437,333
	(c) Disability	1,289,656
	(d) Vested	0
	(e) Withdrawals	24,977
	(f) Total Inactive	$ 4,337,071
(2)	Present Value of Benefits - Active Members	
	(a) Retirement	$ 21,443,700
	(b) Death	1,513,057
	(c) Disability	4,479,475
	(d) Vested	2,055,167
	(e) Withdrawals	2,098,817
	(f) Total Active	$ 31,590,216
(3)	Total Liabilities	$ 35,927,287

Sheriffs' Retirement System

SCHEDULE 3

LIABILITY ALLOCATION AND STATUTORY FUNDING

(1)	Unfunded Past Service Liability		
	(a) Present Value of Benefits	$	35,927,287
	(b) Present Value of Future Normal Costs	$	15,285,580
	(c) Fund Assets	$	26,077,888
	(d) Unfunded Liability (a)-(b)-(c)	$	0
(2)	Contribution Rates		
	(a) Unfunded Contribution Rate		0.000%
	(b) Normal Cost Rate (Schedule 1)		12.754
	(c) Required Funding Rate		14.670%

Sheriffs' Retirement System

SCHEDULE 4

COMPARISON OF VALUATIONS

	1986	1988
Liability for Future Service	$13,369,405	$15,285,580
Unfunded Liability	$ -0-	$ -0-
Assets	$19,480,636	$26,077,888
Normal Cost Rate	11.13%	12.75%
Unfunded Liability Rate	0.00%	0.00%
Total Recommended Rate	11.13%	12.75%
Annual Payroll	$11,509,790	$11,202,404
Annual Benefits	$ 311,955	$ 442,296
Number of Active Members	541	509
Number of Retired Members	37	47
Number of Disabled Members	13	17
Number of Survivor Benefits	9	10
Number of Vested Deferred	3	0

SCHEDULE 5

TABLE 1

Sheriffs' Retirement System

Number of Active Members

Completed Years of Service	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	OVER 65	Total
0-4	13	36	45	49	29	12	12	3	3		202
5-9		9	39	41	23	18	7	12	1	2	152
10-14		1	17	28	27	10	8	5	1		97
15-19			1	10	13	11	4	3			42
20-24					1	4	2	1	1	1	10
25-29							1	2		1	4
30-34								1			1
35-39											
40-UP										1	1
TOTAL	13	46	102	128	93	55	34	27	6	5	509

TABLE 2

Sheriffs' Retirement System

Average Salaries of Active Members

Completed Years of Service	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	OVER 65	Total
0-4	21487	20389	19323	19642	19751	19040	21646	17051	19057		19875
5-9		22708	22597	22684	22420	21909	22877	23350	18938	8810	22386
10-14		16557	24723	25476	24844	21326	23558	26211	24877		24522
15-19			27281	23532	24643	26731	17435	29697			24663
20-24					31163	21638	28491	17218	29702	19095	24071
25-29							20000	16862		21254	18744
30-34								19639			19639
35-39											
40-UP										35292	35292
TOTAL	21487	20759	21553	22197	22696	22122	22208	23040	21781	18652	22009

TABLE 3

Sheriffs' Retirement System

Annual Salaries of Active Members
In Thousands

Completed Years of Service	Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	OVER 65	Total
0-4	279	734	869	963	573	228	260	51	57		4014
5-9		204	881	930	516	394	160	280	19	18	3402
10-14		17	420	713	671	213	188	131	25		2378
15-19			27	235	320	294	69	89			1034
20-24					31	87	57	17	30	19	241
25-29							20	34		21	75
30-34								20			20
35-39											
40-UP										35	35
TOTAL	279	955	2197	2841	2111	1216	754	622	131	93	11199

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TABLE 4

Sheriffs' Retirement System

Summary of Retirees

Number of Members

Age Group								
Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
3	3	7	16	8	8	2	0	47

Total Monthly Benefit

Age Group								
Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
3225	1889	3869	9744	2353	2001	560	0	23641

Average Monthly Benefit

Age Group								
Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
1075	630	553	609	294	250	280	0	503

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TABLE 5

Sheriffs' Retirement System

Summary of Disabled

Number of Members

Age Group

Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
9	4	2	1	1	0	0	0	17

Total Monthly Benefit

Age Group

Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
6122	1582	619	672	620	0	0	0	9616

Average Monthly Benefit

Age Group

Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
680	396	309	672	620	0	0	0	566

TABLE 6

Sheriffs' Retirement System

Summary of Survivors

Number of Members

Age Group								
Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
3	3	2	0	1	1	0	0	10

Total Monthly Benefit

Age Group								
Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
928	1011	1086	0	416	160	0	0	3601

Average Monthly Benefit

Age Group								
Under 55	55-59	60-64	65-69	70-74	75-79	80-84	Over 84	Total
309	337	543	0	416	160	0	0	360

SECTION IV

ACTUARIAL FUNDING METHOD AND ASSUMPTIONS

The true cost of the Sheriffs' Retirement System will be determined by its future experience. In determining the financial requirement of the fund, certain assumptions were made as to the expected future experience. This section summarizes the funding method applied as well as the basic assumptions used.

Any variations in the actual experience of the fund from those assumed in this valuation may cause changes in the projected future costs of the fund. It is therefore necessary that the actuarial assumptions be reviewed from time to time with adjustments as experience warrants. It is also important that regular valuations be performed to determine the financial effect of variations between the actual and assumed experience.

The assumptions shown below were based upon the past experience of the fund together with the projections as to future experience.

Funding Method

The method of funding employed is commonly referred to as the entry age normal cost method. This method establishes a normal cost of each fund as well as an unfunded accrued liability. The normal cost is the level percentage of total salaries required to fund the benefits, assuming this percentage has been contributed since each member's entry into the fund.

The unfunded accrued liability represents the excess of the present value of total liabilities over the present assets of the fund and the present value of expected future contributions for the normal cost.

In order to maintain the fund on an actuarially sound basis, the rate of contribution should be such as to meet the normal cost in addition to making progress towards the amortization of the unfunded liability.

DISCUSSION OF ACTUARIAL ASSUMPTIONS

Mortality Rates

The mortality rates for males and females are based upon the 1983 Group Annuity Mortality Table, and apply to both active members and those receiving benefits. These rates have longer life expectancies than the 1971 Group Annuity Table used in the previous valuation.

Disability Rates

The disability rates for males and females are based upon the 1983 Disability Table and anticipate fewer disabilities than the previous rates as published by the Railroad Retirement Board.

Withdrawal Rates

The withdrawal rates are based upon the actual experience of the system as determined in the 1987 withdrawal experience study.

Salary Scale

The rates of salary increase are based upon an assumed compounded growth rate of 6.5% per annum.

Investment Earnings

It was assumed that the investment earnings would be 8% compounded annually.

Administrative Expenses

It was assumed that the system would incur no administrative expenses beyond those provided by investment earnings in excess of 8%.

Termination Benefits

It was assumed that all members terminating with less than ten years of service would receive an immediate withdrawal of their member contributions with interest. It was further assumed that members with ten or more years of service would select the most advantageous benefits under the given assumptions.

ILLUSTRATION OF ACTUARIAL ASSUMPTIONS

Mortality Rates

The mortality rates are based upon the 1983 Group Annuity Mortality Table.

Age	Deaths Per 10,000 Male Members	Deaths Per 10,000 Female Members
25	5	3
30	6	3
35	9	5
40	12	7
45	22	10
50	39	16
55	61	25
60	92	42
65	156	71
70	275	124
75	446	240
80	741	429
85	1,148	699

Disability Rates

The disability rates are based upon the 1983 Disability Table.

Age	Disabilities per 10,000 Male Members	Disabilities per 10,000 Female Members
25	1	1
30	2	3
35	3	5
40	6	9
45	12	15
50	20	22
55	51	41
60	105	87

Withdrawal Rates

The withdrawal rates illustrated below reflect the turnover experienced by the Sheriffs' Retirement System.

Age	Withdrawals Per 10,000 Active Members
25	875
30	619
35	559
40	459
45	294
50	166

Salary Scale

The salary increases are based upon an assumed compounded growth rate of 6.5% per annum.

Investment Earnings

Future investment earnings are assumed to be 8% compounded annually.

Administrative Expenses

It was assumed that the administrative expenses would be recovered by investment earnings in excess of 8%.

SECTION V

SUMMARY OF BENEFITS AND CONTRIBUTIONS

Effective Date -	July 1, 1974
Member Contributions -	7% of salary.
County Contributions -	7.67% of salary
State Contributions -	Administrative expenses
Retirement Benefit -	Minimum service: 25 years Minimum age: 55 Early Retirement: After 20 years and age 55 Normal form: Life annuity with a death benefit equal to the balance of accumulated deductions not received by the member as of the date of death (modified cash refund annuity). Benefit: 2% of the average monthly salary during the highest 36 consecutive months of earnings for each of the first 25 years of service, plus 1.35% of the average monthly salary for each year of service in excess of 25 years.
Disability Benefit -	Service disability: 50% of the final average salary. Nonservice disability: Actuarial equivalent of the accrued retirement benefit.
Death Benefit -	Service death: 50% of the average monthly salary during the highest 36 consecutive months of earnings less any amounts payable under the Workers' Compensation Act. Nonservice death: Actuarial equivalent of the accrued retirement benefit based upon a retirement age of 60.

Termination Benefit -	Prior to completion of 10 years of service, return return of member's contributions without interest. After completion of 10 years of service, either return of accumulated contributions with interest or the actuarial equivalent of the accrued retirement benefit based upon a retirement age of 55, if involuntarily terminated.